

Make-It

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Briefing Prepared for Make-It Proposers Day

June 3, 2015





Increase Rate of Chemical Discovery & Production

Synthetic chemistry is the backbone of many national security tools & technologies



62% of medicines



>90% of agrochemicals



>90% of coatings



100% of propellants



100% of performance materials



100% of oLEDs & photoresists



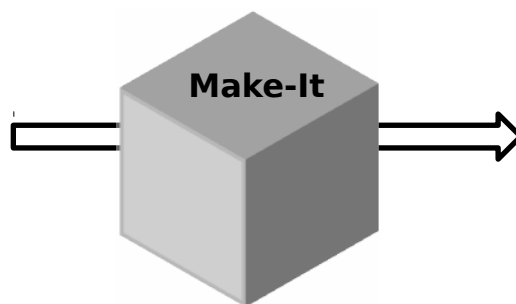
100% of fuels & lubricants



100% of batteries

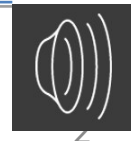
Make-It: Automated chemical synthesis platform

Simple starting materials



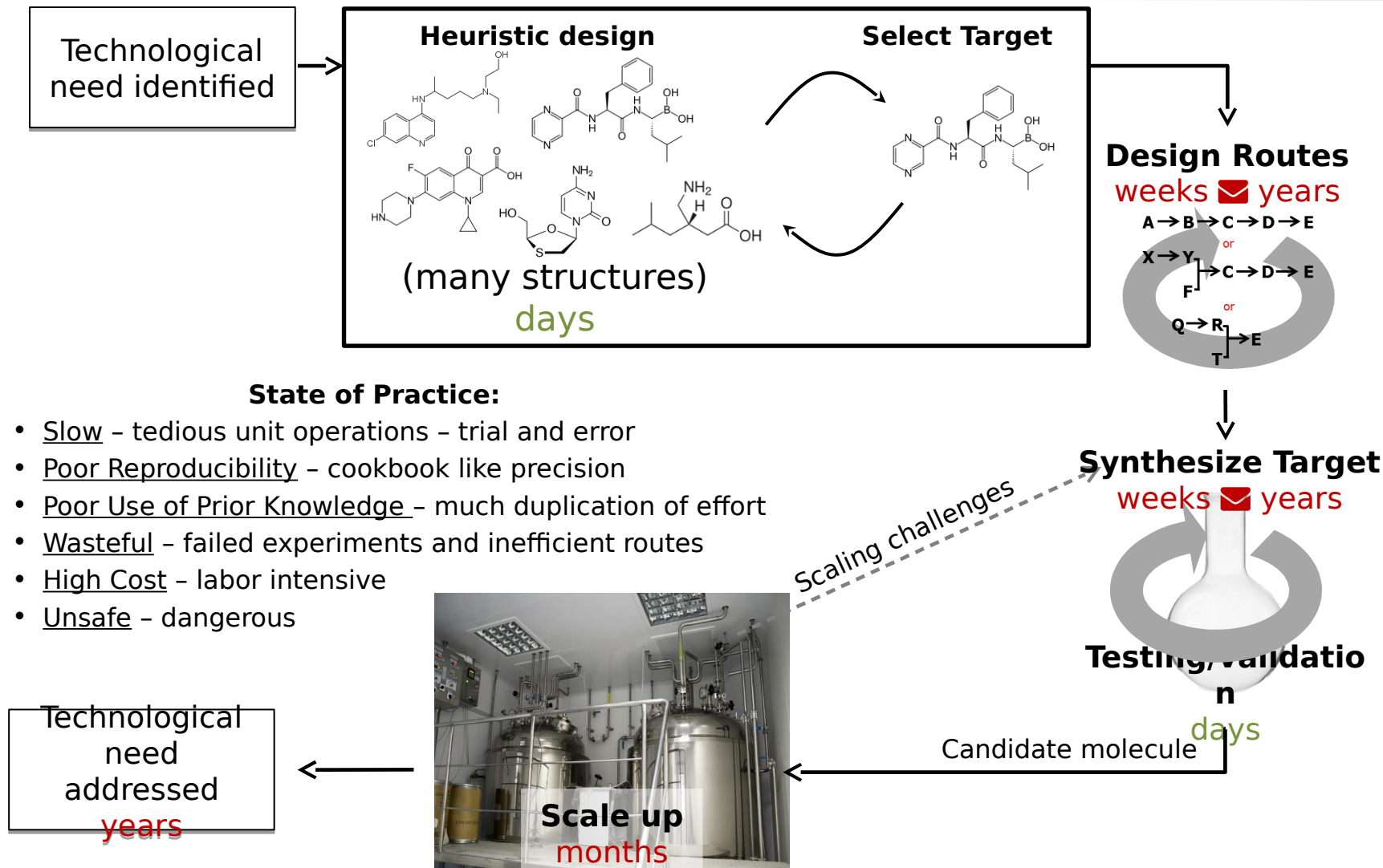
Complex molecules
Discovery to production scale

The Make-It Synthesizer will perform varied multi-step chemistry.





Current Synthetic Approach Slows Innovation

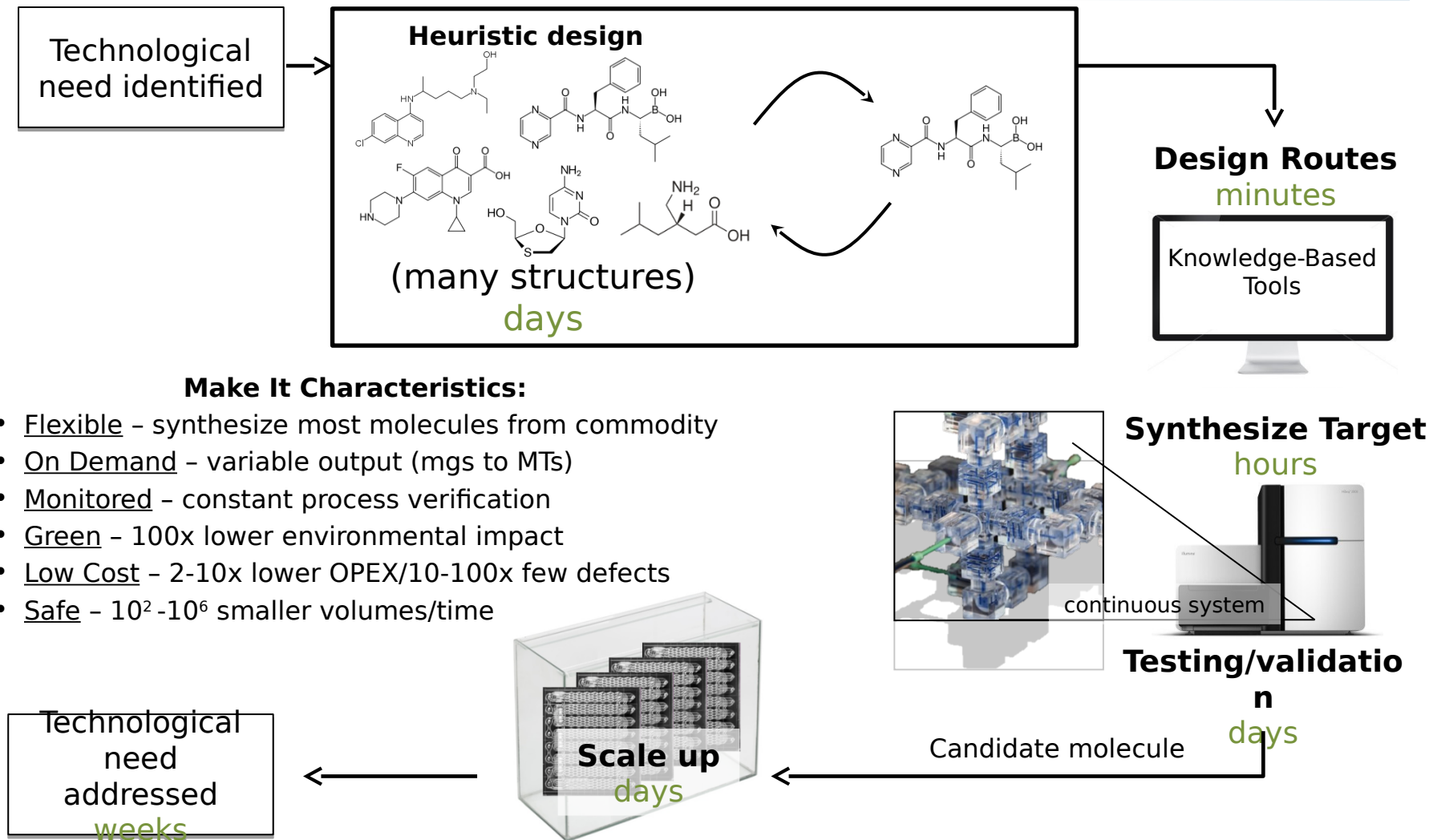


Synthesis is the bottleneck to the discovery of new molecules





Make-It Work Flow

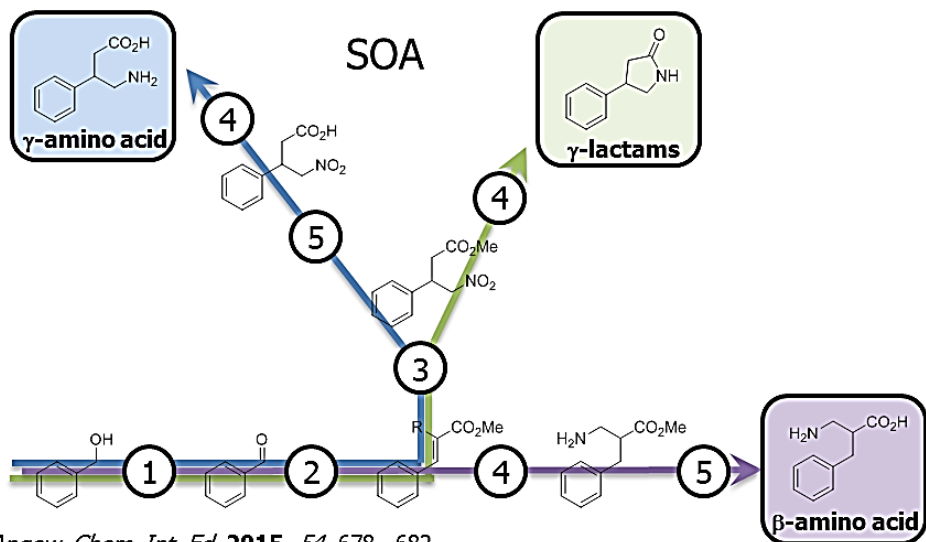


Make-It: An automated & linearly scalable formulation/synthesis platform to speed molecule discovery and production





One Possible Approach: Modular Synthesis



Make-It seeks to:

Link modules w/ graph-like connectivity
Path optimization: lowest cost, highest yield, etc.

Expand hardware
New fluid modules, interconnects, fluidic handlers

Create new firmware & software
Synthetic design, forecasting and implementation

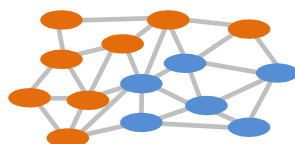
Create new systems approach to chemistry

New theory for complex chemical pathways

Each module performs a unit operation, the module path defines the products

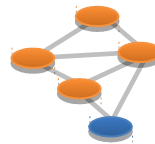
Starting material
delivery system

+



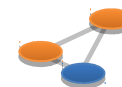
Synthesis Modules

+



Characterization/
Purification
Modules

+



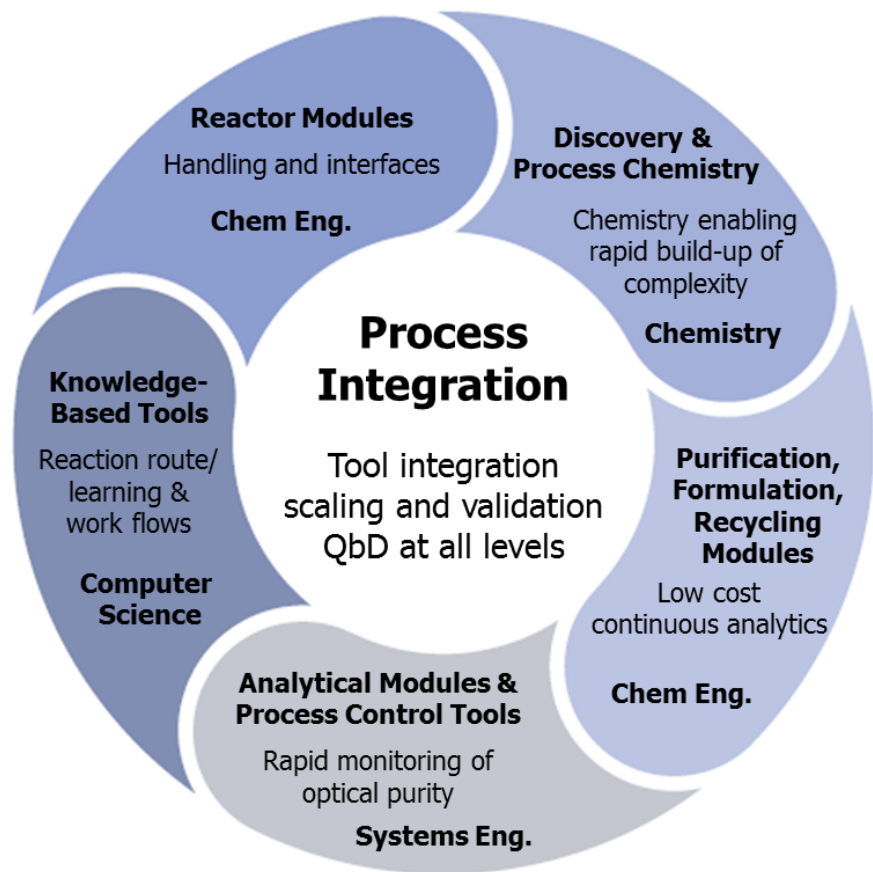
Formulation
Modules





Technical Challenges and Demonstration Case

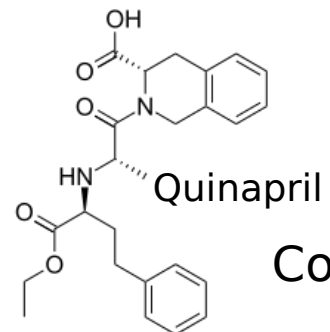
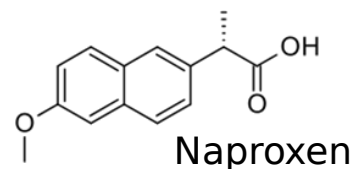
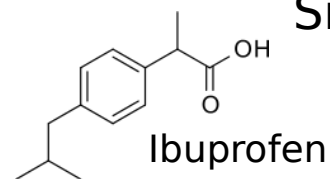
Cross-disciplinary expertise is required to address the anticipated synthetic, engineering and computational complexity



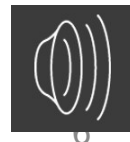
Notional team composition

Medicines provide a well-characterized test case across molecular complexity, while addressing a national security need

Simple

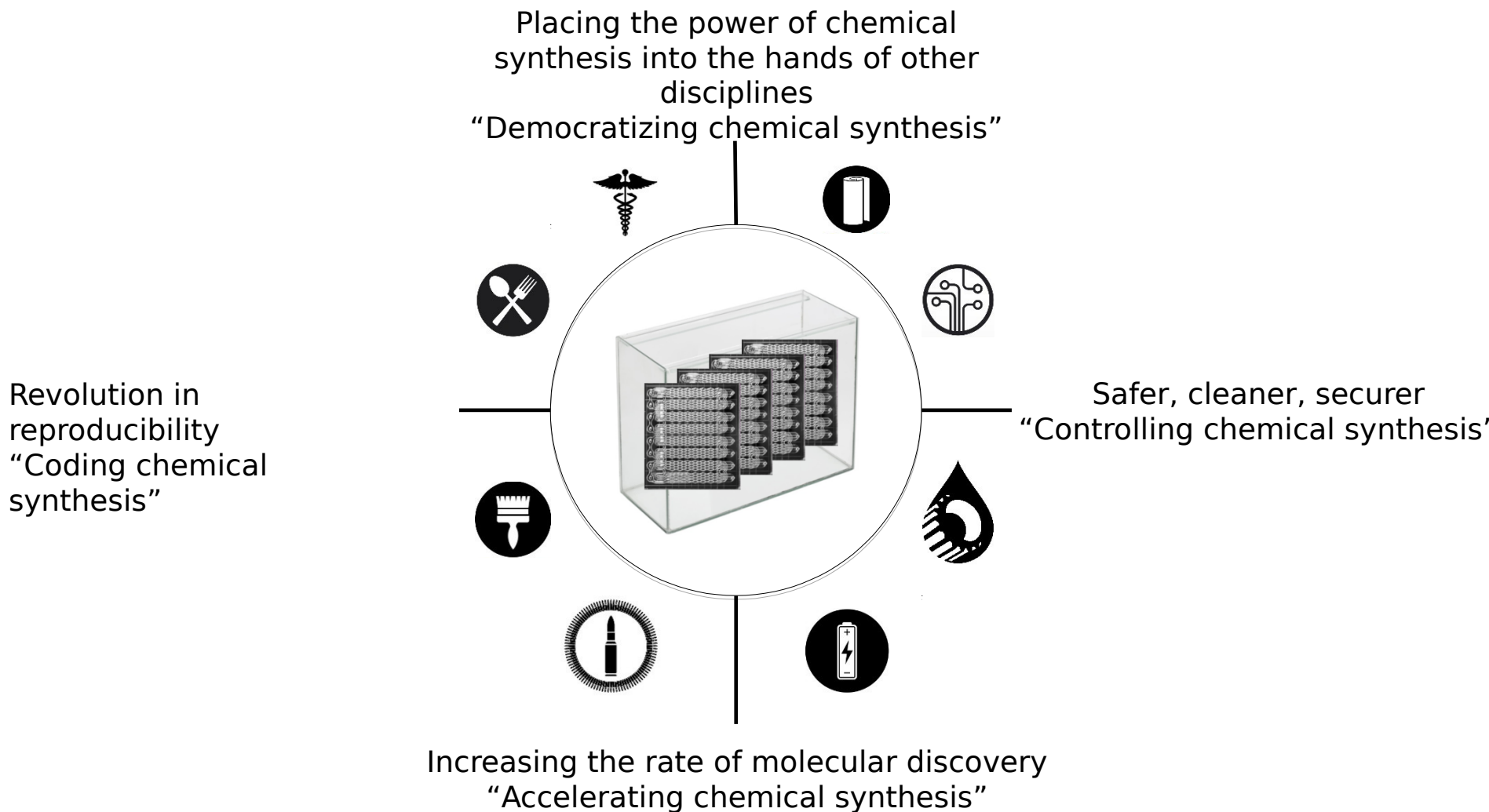


Complex





Accelerating Molecular Synthesis



Make-It will transform the field of chemical synthesis broadly





Make-It Notional Program Structure

Phase 1 (18 months)

Continuous Processes for Simple Structures

First generation system that integrates knowledge-based tools and continuous synthesis hardware for automated synthesis of structurally simple APIs

Option 1 (16 months)

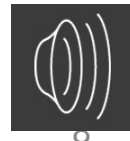
Continuous Processes for Stereochemistry

Second generation system, building on Phase 1 technology, that enables control/monitoring of optical purity

Option 2 (14 months)

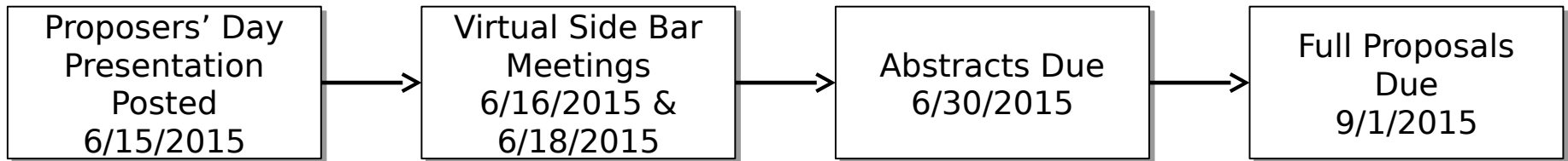
Continuous Processes for Complex Molecules and Formulation

Third generation system, building on Phase 2 technology, that enables convergent approaches, control/monitoring of optical purity and formulation





Program Logistics



TIPS

- Read the BAA carefully
- Ask questions and check the Make-It FAQ document
 - Email questions to: Make-it@darpa.mil
 - FAQ: http://www.darpa.mil/Opportunities/Solicitations/DSO_Solicitations.aspx
- Formation of complete teams is viewed as critical, so please take advantage of the teaming profile
 - Follow the instructions in the BAA
 - You must submit a teaming profile to receive profiles from other groups
 - Profiles are due at 12PM eastern time on 6/19/2015
 - All profiles will be sent out to groups who submitted information by 5PM eastern time on 6/19/2015





www.darpa.mil



DARPA BAA PROCESS

Michael Mutty
DARPA Contract Management Office



June 2015



• READ THE BAA

- DRAFTING THE BAA
 - Words are Meaningful
 - Must and Shall
 - May
- Technical vs Administrative
 - Technical Leads to “Selectable”
 - Administrative Leads to Contract Award
 - Cost Proposal
 - IP Assertions






BAA PROCESS

- PROPOSAL PREPARATION/SUBMISSION
 - Instructions are detailed in the BAA (**Follow closely**)
 - **ALL** questions to Make-It@darpa.mil
 - FAQ (including today's) will be available on the Make-It website on the DSO Homepage (**Read Regularly**)
 - Funding instruments = procurement contract(s), other transactions, assistance instruments (cooperative agreements)
- Assert rights to **all** technical data & computer software generated, developed, and/or delivered to which the Government will receive less than Unlimited Rights
- If you don't justify your proposed costs, we can't justify awarding you a contract.
 - Pay close attention to cost proposal instructions



BAA PROCESS

- EVALUATION/AWARD
 - Read Evaluation Criteria Carefully
 - Government reserves the right to select for award all, some (partial selection), or none of the proposals received.
 - Government anticipate  making multiple awards
 - No common Statement of Work - Proposals evaluated on individual merit and relevance as it relates to the stated research goals/objectives rather than against each other
 - Overview of the Process
 - 3 Government Reviewers
 - PM Recommendation to the SRO
 - Notification

